

Amendments to the Claims

The listing of claims below is intended to replace all prior listings of the claims:

Claims 1-103 (Canceled)

104. (New) A stem cell marker characterized by binding to a GCTM-5 antibody or active fragment thereof.

105. (New) The stem cell marker according to claim 104 which migrates on an SDS-PAGE gel with an apparent molecular weight of 50kDa.

106. (New) The stem cell marker according to claim 104 wherein the GCTM-5 antibody or fragment is produced by a hybridoma having an ECACC accession number 03101603.

107. (New) The stem cell marker according to claim 104 comprising a GCTM-5 epitope or equivalent or a GCTM-5 antigen.

108. (New) The stem cell marker according to claim 104 of a cell selected from the group consisting of: a ductal cell including a biliary cell or a biliary epithelial cell; a hepatoblast; a pancreatic stem cell; an endodermal stem cell; a hepatic stem cell; a hepatic progenitor cell; a pancreatic stem cell; and a pancreatic progenitor cell.

109. (New) A detector of a cell type which identifies on the cell type a cell marker according to claim 104.

110. (New) The detector according to claim 109 which is an antibody, fragment or equivalent thereof, ligand or complimentary molecule to the cell marker.

111. (New) The detector according to claim 109 which is an antibody, fragment or equivalent thereof.

112. (New) The detector according to claim 109 which is a GCTM-5 antibody or active fragment thereof.

113. (New) The detector according to claim 109 which can compete against a GCTM-5 antibody for binding.

114. (New) The detector according to claim 112 that is produced by a hybridoma having an ECACC accession number 03101603.

115. (New) The detector according to claim 109 which detects the cell marker on a stem cell.

116. (New) The detector according to claim 109 which detects the cell marker on a sub population of stem cells.

117. (New) The detector according to claim 109 wherein the stem cell is selected from the group consisting of: a hepatoblast; a hepatic stem cell; a hepatic progenitor cell; a pancreatic stem cell; and a pancreatic progenitor cell.

118. (New) The detector according to claim 115 wherein the stem cell is a cell of the biliary epithelium.

119. (New) The detector according to claim 115 wherein the stem cell is proliferating.

120. (New) A hybridoma which produces an antibody to a cell marker according to claim 104.

121. (New) A hybridoma which produces a GCTM-5 antibody or fragment thereof.

122. (New) The hybridoma according to claim 121 which has an ECACC accession number 03101603.

123. (New) A method of identifying a sub-population of stem cells in a cell sample, said method including:

identifying the stem cells which express a marker according to claim 104.

124. (New) The method according to claim 123 wherein the subpopulation of stem cells includes a cell selected from the group consisting of: a hepatoblast; a hepatic stem cell; a hepatic progenitor cell; a pancreatic stem cell; a pancreatic progenitor cell; a biliary cell; and a biliary epithelial cell.

125. (New) The method according to claim 124 wherein the stem cell or progenitor cell is proliferating.

126. (New) The method according to claim 123 wherein the stem cells are identified by a GCTM-5 antibody or fragment thereof.

127. (New) The method according to claim 126 wherein the GCTM-5 antibody or fragment thereof is produced by a hybridoma having an ECACC accession number 03101603.

128. (New) The method according to claim 123 further comprising subjecting the stem cells to markers selected from the group including N-CAM, HEA-125, CK-19, harmonin and Ep-CAM.

129. (New) A method of isolating a sub population of stem cells, said method comprising:

isolating the stem cells which express a marker, said marker according to claim 104.

130. (New) The method according to claim 129 wherein the subpopulation of stem cell includes a cell selected from the group consisting of: a hepatoblast; a hepatic stem cell; a hepatic progenitor cell; a pancreatic stem cell; a pancreatic progenitor cell; a biliary cell; and a biliary epithelial cell.

131. (New) The method according to claim 130 wherein the stem cell or progenitor cell is proliferating.

132. (New) The method according to claim 129 wherein the cells are isolated using a GCTM-5 antibody, fragment or equivalent thereof.

133. (New) The method according to claim 132 wherein the GCTM-5 antibody or fragment thereof is produced by a hybridoma having an ECACC accession number 03101603.

134. (New) The method according to claim 129 further comprising isolating cells that select for or against markers, said markers selected from the group including N-CAM, HEA-125, CK-19, harmonin and Ep-CAM.

135. (New) A subpopulation of cells which express a marker according to claim 104.

136. (New) A subpopulation of stem cells prepared by the method according to claim 129.

137. (New) The subpopulation according to claim 135 comprising a cell selected from the group consisting of: a hepatoblast; a hepatic stem cell; a hepatic progenitor cell; a pancreatic stem cell; a pancreatic progenitor cell; a biliary cell; and a biliary epithelial cell.

138. (New) The subpopulation according to claim 135, wherein the stem cells or progenitor cells are proliferating.

139. (New) The subpopulation according to claim 135 including liver cells.

140. (New) The subpopulation according to claim 135 including pancreatic cells.

141. (New) An isolated cell which expresses a marker according to claim 104.

142. (New) An isolated cell derived from a subpopulation according to claim 135.

143. (New) The isolated cell according to claim 141 which is a cell selected from the group consisting of: a hepatoblast; a hepatic stem cell; a hepatic progenitor cell; a pancreatic stem cell; a pancreatic progenitor cell; a biliary cell; and a biliary epithelial cell.

144. (New) The isolated cell according to claim 141 wherein the stem cell or progenitor cell is proliferating.

145. (New) A method of culturing a hepatic or pancreatic stem cell or progenitor cell, said method comprising:

isolating the cells which express a marker according to claim 104; and
culturing the cells.

146. (New) The method according to claim 145 wherein the isolated stem cell is a hepatoblast.

147. (New) The method according to claim 145 wherein the hepatic or pancreatic stem cell or progenitor cell is further differentiated to a cell selected from the group including a hepatoblast, liver, hepatic or pancreatic cell.

148. (New) The method according to claim 147 wherein the hepatic stem cell is further differentiated to a liver cell.

149. (New) The method according to claim 147 wherein the hepatic stem cell is further differentiated to a pancreatic cell.

150. (New) The method according to claim 145 wherein the hepatic stem cell is proliferating.

151. (New) A use of the cells which express a marker according to claim 104, said use selected from the group including transplantation, ex vivo expansion, reprogramming to generate other cell types and for identifying new therapeutic agents that may affect how these cells live, grow, replicate, differentiate and die.

152. (New) A method of treating a liver disorder in a patient, said method comprising:
isolating a liver stem cell by a method according to claim 129; and
transferring the liver stem cell to the patient.
153. (New) The method according to claim 152 wherein the liver stem cell is a hepatoblast.
154. (New) The method according to claim 152 wherein the liver stem cell is proliferating.
155. (New) The method according to claim 152 wherein the liver stem cell is caused to further differentiate to a liver cell.
156. (New) The method according to claim 154 wherein the liver disorder is selected from the group including PBC, EHBA or ALD.
157. (New) A method of treating a pancreatic disorder in a patient, said method comprising:
isolating a liver stem cell by a method according to claim 129; and
transferring the liver stem cell to the patient.
158. (New) The method according to claim 157 wherein the liver stem cell is a hepatoblast.
159. (New) The method according to claim 157 wherein the liver stem cell is proliferating.
160. (New) The method according to claim 157 wherein the liver stem cell is caused to further differentiate to a pancreatic cell.
161. (New) The method according to claim 157 wherein the pancreatic disorder is diabetes.

162. (New) A method of treating a liver or pancreatic cancer, said method comprising:

delivering a toxin conjugated to a GCTM-5 antibody or active fragment thereof to a liver or pancreatic stem cell or liver or pancreatic progenitor cell in the liver or pancreatic cancer, wherein the cell expresses a marker according to claim 104.

163. (New) The method according to claim 162 wherein the liver or pancreatic stem cell or progenitor cell is proliferating.

164. (New) A method of diagnosing or monitoring a liver or pancreatic condition in a patient, said method comprising:

detecting GCTM-5 antigen, epitope or equivalent in a biological sample.

165. (New) The method according to claim 164 wherein the GCTM-5 antigen, epitope or equivalent is detected with a GCTM-5 antibody, or fragment thereof.

166. (New) The method according to claim 165 wherein the GCTM-5 antibody or fragment is produced by a hybridoma having an ECACC accession number 03101603.

167. (New) The method according to claim 164 wherein the biological sample is body fluid or a tissue sample.

168. (New) The method according to claim 164 wherein the liver condition is selected from the group including PBC, EHBA, ALD, transplantation of liver stem cells and in vivo expansion of liver stem cells.

169. (New) The method according to claim 164 wherein the pancreatic condition is selected from the group consisting of diabetes, pancreatic malignancies, transplantation of pancreatic stem cells and in vivo expansion of pancreatic stem cells.

170. (New) A kit for detecting a cell marker, said kit comprising a detector which detects the marker according to claim 104.

171. (New) The kit according to claim 170 which detects a cell marker on a subpopulation of stem cells or in a biological sample.

172. (New) The kit according to claim 170 which detects the cell marker on a cell selected from the group consisting of: a hepatoblast; a hepatic stem cell; a hepatic progenitor cell; a pancreatic stem cell; a pancreatic progenitor cell; a biliary cell; and a biliary epithelial cell.

173. (New) The kit according to claim 170 which detects the cell marker on a stem cell that is proliferating.

174. (New) The kit according to claim 170 which detects the cell marker in a biological sample including cell culture, tissue culture, conditioned medium, tissue sample, blood, serum, plasma and other bodily fluids and biopsy samples.

175. (New) The kit according to claim 170 wherein the detector is a GCTM-5 antibody or active fragment thereof.

176. (New) The kit according to claim 175 wherein the antibody is produced by a hybridoma having an accession number ECACC 03101603..

177. (New) A kit for isolating a subpopulation of stem cells, said kit comprising a detector for detecting cells expressing a marker according to claim 104 and a means to separate the cells detected by the detector.

178. (New) The kit according to claim 177 which isolates a cell selected from the group consisting of: a hepatoblast; a hepatic stem cell; a hepatic progenitor cell; a pancreatic stem cell; a pancreatic progenitor cell; a biliary cell; and a biliary epithelial cell.

179. (New) The kit according to claim 177 which isolates a stem cell that is proliferating.

180. (New) The kit according to claim 177 which isolates a stem cell from a biological sample including cell culture, tissue culture, conditioned medium, tissue sample, blood, serum, plasma and other bodily fluids and biopsy samples.

181. (New) The kit according to claim 177 wherein the detector is a GCTM-5 antibody or active fragment thereof.

182. (New) The kit according to claim 181 wherein the antibody is produced by a hybridoma having an accession number ECACC 03101603.